Excerpts from the Department Record
INDEX TO MATERIALS

1. **Documentation from DEP project #S-021177-SE-B-R:**
   - **Annual wood ash production**
   - **Sampling and analysis plan and utilization budget development--soil sampling**
   - **Financial ability-program cost**
2. **LP Corp soil analysis reports**
3. **Fax: LP Corp utilization site soil Mn concentrations**

Documentation from DEP project #S-021177-SE-B-R

Annual wood ash production

nutrient needs as demonstrated by soil testing of farm fields. Annual wood ash production ranges from 9,500 to 14,500 conditioned tons. In addition, BAI is seeking approval to utilize the ash as a loam enhancer for area landscape specialists.

Prior to transport, the ash will be conditioned with water to approximately 35% moisture to prevent nuisance dust and extinguish any live embers. Transportation of the ash to utilization sites will be by way of enclosed transport vehicles. Ash will be distributed on farm fields by the grower or contractor, using common lime or manure spreaders. Short - term field stacking of ash is anticipated when site conditions prohibit immediate application.

BAI is also permitted under air emission license A-577-70-A-I (draft) to combust up to 10% of the daily / annual feed rate (% weight) Reprocessed Wood Fuel (RFW for this purpose includes chipped utility poles, railroad ties and other similar chemically treated wood products) and up to 60% by weight of daily / annual feed rate (% weight) demolition debris (CDWD), including pallets, with painted, chemically treated wood and wood mixed with roofing and other non-wood related demolition products having been removed such that the amount remaining is determined to be insignificant. BAI is seeking approval to utilize alternative fuels in the facility's fuel mix. Wood ash that does not meet the residual quality standards indicated in CMR Chapter 419, Table 419.4 will be applied in accordance to those standards included in 419.4 §J (3), (4)(b) and (5)(b) or disposed of in a landfill permitted to accept the ash.

IV. AGRONOMIC BENEFIT

IV.1 *Benefit*

Wood ash will be used as a liming agent and as a potassium source. Because the concentration of other nutrients are in relatively minor amounts, it is not anticipated that application volumes necessary to fulfill the liming and potassium needs of the target crop would be adequate to satisfy other crop nutrient requirements.

Analysis of BAI wood ash has been conducted for baseline nutrients and calcium carbonate equivalents (CCE) in accordance with Chapter 405, §6.D (a) and (c). Results of these analyses indicate that the ash contains an average CCE of approximately 50%, a potassium concentration of approximately 5% and a magnesium concentration of approximately 1.5-%.

Sampling and analysis plan and utilization budget development--soil sampling

a. Plant Name and Address, phone number and plant contact

b. Material & Source (e.g. conditioned Wood Ash - Ash storage building)

c. Type of sample (e.g. random grab sample)

d. Date of collection (e.g. Nov. 1, 2000 @ 14:00)

e. Sample number (e.g. 0089)

f. Affix any appropriate hazard warnings or precautionary measures for safe handling.

5. To the second labeled container, add approximately 50% of the well-mixed sample and seal to prevent moisture loss. The other half of the sample will be retained on-site for reference in the event that the sample submitted for analysis becomes misplaced or additional testing is required.

6. Fill out all appropriate chain-of-custody forms. Insure that one copy is retained on-site. Include any special conditions or remarks.

7. Document all appropriate information in the Sample Sendout Log (*see Appendix A.3).*

10. All split samples should be retained on-site for a minimum of one year from the date of submission for analysis.

11. Indicate in cover letter parameters to be tested for and that analysis is to follow test methodologies outlined in US EPA SW 846 (*see Appendix A.1*).

VI.2 *Soil Sampling For Nutrients*

Soil sampling to determine the fertility status of agricultural soils shall be as follows: Large uniform fields shall be divided into blocks of eight acres or less and each block shall be characterized by a separate composite sample. One composite sample shall serve to characterize each field smaller eight acres. On fields that have diverse natural properties, the soil sampler shall pay close attention to sample groupings that will show changes in topography, texture, drainage and agricultural management of different regions of the field. Soil samples shall be taken with a special tool such as a soil auger, soil probe, shovel or a spade. These tools shall be clean and not rusty. A minimum of fifteen separate samples shall be taken from each block of land or sampling area and combined into a composite sample[2]. Soil testing should follow those methodologies indicated in the Maine Soil Testing Handbook for Professionals in Agriculture, Horticulture, Nutrient and Residuals [Third Addition] or equivalent.

VI.3 *Soil Sampling Of Agriculture Soil For Regulated Metals*

Coordinates shall be set up for each uniform soil area to be sampled by establishing two base lines at right angles to each other that intersect at one corner of the area. Note: The sampler shall establish a scale interval along the base line (in unit of ft., yds., etc.). Pairs of random numbers are drawn from a random number table and used to locate a point on each base line.

The sampling point is the intersection of the two lines drawn perpendicular to the base lines through these two points. If the sampling point is outside the uniform sampling area, the point is disregarded. The sampling points must be chosen randomly so the entire area has the potential to be sampled. The procedure is repeated until fifteen sampling points are designated. The coordinates and sampling points shall be mapped out on paper before sampling begins. The points are located on the ground by carefully pacing them out or actual measurement. Soil samples shall be taken with a special tool such as a soil auger, soil probe, shovel or a spade. These tools shall be clean and not rusty. A minimum of fifteen separate samples shall be taken from each block of land or sampling area and combined into a composite sample. All soil samples shall be approximately equal in size. The fifteen individual samples collected per eight acres shall be placed in a clean plastic bucket and thoroughly mixed with spade or trowel. A subsample of about one-pint in volume shall be removed, placed in a suitable container properly labeled and submitted for analysis[3]. Analysis is to follow test methodologies outlined in US EPA SW 846 (*see Appendix A. 1*).

VII. RISK MANAGEMENT

BAI proposes to use generated ash as a liming agent and as a potassium source. In direct watersheds of Water Bodies Most at Risk From New Development, BAI proposes that application rates be reduced to a rate no greater than that necessary to supply the phosphorous requirements of the target crop as directed by soil test reports, actual availability of this nutrient in the ash and application of other phosphorous-containing fertilizers.

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[2] *CMR Chapter 567 Appendix D §I.A.2.a & b. Dec. 1989*

- General location map (Delorme of equivalent)
- 7.5-minute series USGS topographical map
- Soil survey map
- Aquifer map

XI.2 *Utilization Budget Development*

1. Soil samples are collected by the grower and sent for testing to determine the baseline soil fertility status of the farm fields. It is stressed to all growers that sampling conform to the following:
   - One composite sample for every 8 acres is requested for utilization (soil test reports should be less than one year old unless nutrients or other amendments have not been applied since soil sampling occurred).
   - Soil samples should be analyzed for the following:
     a. Soil pH
     b. Liming index
     c. Soil concentrations (lb / acre) of phosphorous, potassium, magnesium and calcium
     d. Calculated CEC and calculated base saturations for potassium, magnesium, calcium and acidity (based on target pH)
     e. Sodium
     f. Fertilizer recommendations and lime requirements to reach target pH
   - Nomenclature commonly used for farms and fields is used to ensure consistency for wood ash budget development
4. Budgets are developed for each farm field. For fields that are greater than 8 acres in size, soil test parameters are averaged for that field, unless the farm field will contain more than one crop.
5. A copy of the utilization budget and soil test reports is provided to the grower.
6. A review of the site is conducted to affirm that field stacking site locations will not pose risk to waters of the State or create a nuisance.
7. On multiple stacking sites the sites are flagged with farm name, site number and delivery volume.

Financial ability-program cost

VIII. FINANCIAL AND TECHNICAL ABILITY

The estimated cost of the facility's wood ash utilization program is approximately $200,000.00 annually. Financial information regarding Boralex Inc. can be found in Appendix C.

Management and staff at BAI have over seven years of experience in the operation and management of the facility's wood ash utilization program.

IX. PROTECTION OF THE WATERS OF THE STATE

Analysis of the wood ash shall be conducted using composite samples to determine within a known variability the chemical content of the material. Analytical results will be used to demonstrate to the Department that the wood ash contains no deleterious substance at a level that may endanger the public health, safety or welfare or endanger any flora or fauna or damage to the environment. Wood ash utilization and storage will follow all Department guidelines to ensure that:

- The material will not pollute any water of the State.
- Will not contaminate the ambient air.
- Will not constitute a hazard to health or welfare.
- Will not create a nuisance.

If, at any time the composition of the wood ash should change, as demonstrated by analysis, the Department will be duly notified. At that point and until analysis demonstrates otherwise, wood ash application shall be reduced or other measures taken to ensure that the material does not pose a threat to the public health, safety and welfare or pose a threat of damage to the environment.

X. STATUTORY REQUIREMENTS

X.1 *Traffic*

Under normal operations, no greater than ten loads of ash is transported to any site in any 24-hour period. Site distances will vary within a twenty-five mile radius from the plant. Because of the number of sites proposed for utilization an accident study of each proposed site has not been

[3] *CMR Chapter 567 Appendix D §1.A.3.b.1 Dec. 1989*

LP Corp soil analysis reports

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Waterville, Maine 04903-0788

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Winslow, Maine 04901

Administrative Offices
Phone: 207-873-7711
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Customer Service
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ANALYSIS REPORT

Attention: MARK STILE
LOUISIANA-PACIFIC-HOULTON
STATION RD NEW LIMERICK 04761
PO BOX 396
HOULTON ME 04730

Lab ID Number: AI05322
Project Number: Wood Ash-Manganese Background
P.O. Number: 5341879
Date Collected: 05/01/2006 12:00 AM
DateReceived: 06/06/2006 10:30 AM
Date Reported: 06/20/2006

Sample Matrix: SOIL
Sample Description: S6/06-08-Richard Sloat
Sample Type: Grab

Parameter	Result	Qualifier	Unit	Detection Limit	Method	Preparation Date/Time		Analysis Date/Time		Analyst
Manganese Total	2000		mg/Kg	8.4	EPA 6010B	06/12/2006	13:35	06/13/2006	14:34	MTG
* *A 1:10 dilution was performed in order to bring the concentration of manganese into the calibration range. Reporting limits have been adjusted accordingly.*										
Solids, Percent	79		%	0.01	SM 2540G	06/07/2006	11:14	06/08/2006	11:14	AP

Comments:

Reporting limits are adjusted for sample weight and total solids. Results are expressed on a dry weight basis.

Results meet the requirements of the NELAC standards unless otherwise noted above.

Reviewed By James F. Galasyn **Review Date:** 06/20/2006

James F. Galasyn, Ph.D., Chemistry Lab Manager

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ANALYSIS REPORT

Attention: MARK STILE
LOUISIANA-PACIFIC-HOULTON
STATION RD NEW LIMERICK 04761
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HOULTON ME 04730

Lab ID Number: AI05321
Project Number: Wood Ash-Manganese Background
P.O. Number: 5341879
Date Collected: 04/29/2006 12:00 AM
DateReceived: 06/06/2006 10:30 AM
Date Reported: 06/20/2006

Sample Matrix: SOIL
Sample Description: S6/06-07-Robert Fitzpatrick
Sample Type: Grab

Parameter	Result	Qualifier	Unit	Detection Limit	Method	Preparation Date/Time		Analysis Date/Time		Analyst
Manganese Total	480		mg/Kg	0.75	EPA 6010B	06/12/2006	13:35	06/13/2006	13:17	MTG
Solids, Percent	97		%	0.01	SM 2540G	06/07/2006	11:14	06/08/2006	11:14	AP

Comments:

Reporting limits are adjusted for sample weight and total solids. Results are expressed on a dry weight basis.

Results meet the requirements of the NELAC standards unless otherwise noted above.

Reviewed By James F. Galasyn **Review Date:** 06/20/2006

James F. Galasyn, Ph.D., Chemistry Lab Manager

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ANALYSIS REPORT

Attention: MARK STILE
LOUISIANA-PACIFIC-HOULTON
STATION RD NEW LIMERICK 04761
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HOULTON ME 04730

Lab ID Number: AI05320
Project Number: Wood Ash-Manganese Background
P.O. Number: 5341879
Date Collected: 09/02/2005 12:00 AM
DateReceived: 06/06/2006 10:30 AM
Date Reported: 06/20/2006

Sample Matrix: SOIL
Sample Description: S6/06-06-Earl Thibideau
Sample Type: Grab

Parameter	Result	Qualifier	Unit	Detection Limit	Method	Preparation Date/Time		Analysis Date/Time		Analyst
Manganese Total	<0.76		mg/Kg	0.77	EPA 6010B	06/12/2006	13:35	06/13/2006	13:14	MTG
Solids, Percent	96		%	0.01	SM 2540G	06/07/2006	11:14	06/08/2006	11:14	AP

Comments:

Reporting limits are adjusted for sample weight and total solids. Results are expressed on a dry weight basis.

Results meet the requirements of the NELAC standards unless otherwise noted above.

Reviewed By James F. Galasyn **Review Date:** 06/20/2006

James F. Galasyn, Ph.D., Chemistry Lab Manager

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Attention: MARK STILE
LOUISIANA-PACIFIC-HOULTON
STATION RD NEW LIMERICK 04761
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Lab ID Number: AI06679
Project Number: Wood Ash 2006
P.O. Number: 5344222
Date Collected: 06/06/2006 12:00 AM
DateReceived: 06/30/2006 10:30 AM
Date Reported: 07/11/2006

Sample Matrix: SOIL
Sample Description: S6/06-12 Currier Farms
Sample Type: Composite

Parameter	Result	Qualifier	Unit	Detection Limit	Method	Preparation Date/Time	Analysis Date/Time	Analyst
Manganese Total	1100		mg/Kg	4.2	EPA 6010B	07/06/2006 14:00	07/10/2006 16:02	MTG
** A 1:10 dilution was performed in order to bring the concentration of manganese into the calibration range. Reporting limits have been adjusted accordingly.*								
Solids, Percent	74		%	0.01	SM 2540G	07/01/2006 14:00	07/05/2006 8:00	JEY

Comments:

Reporting limits are adjusted for sample weight and total solids. Results are expressed on a dry weight basis.

Results meet the requirements of the NELAC standards unless otherwise noted above.

Reviewed By James F. Galasyn — Review Date: 07/11/2006

James F. Galasyn, Ph.D., Chemistry Lab Manager

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Attention: MARK STILE
LOUISIANA-PACIFIC-HOULTON
STATION RD NEW LIMERICK 04761
PO BOX 396
HOULTON ME 04730

Lab ID Number: AI06680
Project Number: Wood Ash 2006
P.O. Number: 5344222
Date Collected: 06/07/2006 12:00 AM
DateReceived: 06/30/2006 10:30 AM
Date Reported: 07/11/2006

Sample Matrix: SOIL
Sample Description: S6/06-14 Jack Grass
Sample Type: Composite

Parameter	Result	Qualifier	Unit	Detection Limit	Method	Preparation Date/Time	Analysis Date/Time	Analyst
Manganese Total	1200		mg/Kg	6.0	EPA 6010B	09/06/2006 14:00	07/10/2006 16:05	MTG
* *A 1:10 dilution was performed in order to bring the concentration of manganese into the calibration range. Reporting limits have been adjusted accordingly.*								
Solids, Percent	84		%	0.01	SM 2540G	07/01/2006 14:00	07/05/2006 8:00	JEY

Comments:

Reporting limits are adjusted for sample weight and total solids. Results are expressed on a dry weight basis.

Results meet the requirements of the NELAC standards unless otherwise noted above.

Reviewed By James F. Galasyn — Review Date: 07/11/2006

James F. Galasyn, Ph.D., Chemistry Lab Manager

2 of 6

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Attention: MARK STILE
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HOULTON ME 04730

Lab ID Number: AI06683
Project Number: Wood Ash 2006
P.O. Number: 5344222
Date Collected: 06/04/2006 12:00 AM
DateReceived: 06/30/2006 10:30 AM
Date Reported: 07/11/2006

Sample Matrix: SOIL
Sample Description: ~~S6/06-20~~ Richie Suitter
Sample Type: Composite

Parameter	Result	Qualifier	Unit	Detection Limit	Method	Preparation Date/Time	Analysis Date/Time	Analyst
Manganese Total	1400		mg/Kg	12	EPA 6010B	09/06/2006 14:00	07/10/2006 16:13	MTG
** A 1:10 dilution was performed in order to bring the concentration of manganese into the calibration range. Reporting limits have been adjusted accordingly.*								
Solids, Percent	78		%	0.01	SM 2540G	07/01/2006 14:00	07/05/2006 8:00	JEY

Comments:

Reporting limits are adjusted for sample weight and total solids. Results are expressed on a dry weight basis.

Results meet the requirements of the NELAC standards unless otherwise noted above.

Reviewed By James F. Galasyn **Review Date:** 07/11/2006

James F. Galasyn, Ph.D., Chemistry Lab Manager

5 pc

Fax: LP Corp utilization site soil Mn concentrations

LP Corp.	Wood Ash Utilization Site Soil Background/Baseline Mn Concentrations				
Site ID	Site Name	Sample Date	Sample Type	Mn conc. (mg/kg)	Comments
S6/06-06	Earl Thibideau	9/2/05	Grab	<0.76	
S6/06-07	Robert Fitzpatrick	4/29/06	Grab	480	
S6/06-08	Richard Sloat	5/1/06	Grab	2000	
S6/06-20	Richie Suitter	6/4/06	Composite	1400	
S6/06-12	Currier Farms	6/6/06	Composite	1100	
S6/06-14	Jack Grass	6/7/06	Composite	1200	
S7/07-05	Les McNelly	10/1/06	Composite	1500	
S7/07-06	D Foster	10/1/06	Composite	1100	
S7/07-07	Brent Hammond	10/1/06	Composite	1200	
S7/07-10	C Moody	10/1/06	Composite	580	
S7/07-11	Transue	10/1/06	Composite	1300	
S7/07-12	J Whited	10/1/06	Composite	1000	
S7/07-13	Gariboto	10/1/06	Composite	620	
S7/07-15	Jay Burpee	10/1/06	Composite	720	
S7/07-16	H Conlogue	10/1/06	Composite	610	
S7/07-17	Budryk	10/1/06	Composite	570	
S7/07-18	F Drew	10/1/06	Composite	590	
S7/07-19	K Bartlett	10/1/06	Composite	810	
S7/07-21	B Bartlett	10/1/06	Composite	880	
S7/07-22	D Burpee	10/1/06	Composite	740	
S7/07-23	Anna Delong	10/1/06	Composite	1000	
S7/07-24	P Brannen	10/1/06	Composite	2000	
S7/07-25	Ted Friel	10/1/06	Composite	1400	
S7/07-27	Ben Marley	10/1/06	Composite	570	
S7/07-28	Mike Nadeau	10/1/06	Composite	680	
S7/07-29	M McCluskey	10/1/06	Composite	1800	
S7/07-30	Beauchemin	10/1/06	Composite	500	
S7/07-31	K Swallow	10/1/06	Composite	1600	
S7/07-32	Chas. Smith	10/1/06	Composite	780	
S7/07-33	J Ledger	10/1/06	Composite	910	
S7/07-34	G Golding	10/1/06	Composite	880	
S7/07-35	B Lawlor	10/1/06	Composite	1800	
S7/07-36	Petrosky	10/1/06	Composite	620	

Post-it® Fax Note 7671 | Date 7/16/09 | # of pages ▶ 3
To John Leski | From Jay Duncan
Co./Dept. NEO/LP/MDEP | Phone # | Fax # 948-5352

LP Corp.	Wood Ash Utilization Site Soil Background/Baseline Mn Concentrations				
Site ID	Site Name	Sample Date	Sample Type	Mn conc. (mg/kg)	Comments
S7/07-38	L Foster	10/1/06	Composite	610	
S7/07-39	Travis Libby	10/1/06	Composite	1900	
S7/07-40	Wilcox	10/1/06	Composite	860	
S7/07-41	D Suitter	10/1/06	Composite	590	
S7/07-42	Delucca 2010	10/1/06	Composite	1100	
S7/07-43	Delucca 1786	10/1/06	Composite	980	
S7/07-44	Delucca 6110	10/1/06	Composite	840	
S7/07-45	GL Fitzpatrick	10/1/06	Composite	1600	
S7/07-46	Dale Henderson	10/1/06	Composite	780	
S7/07-47	Bob Fitzpatrick	10/1/06	Composite	880	
S7/07-48	Casey White	10/1/06	Composite	800	
S7/07-49	Walt DeWitt	10/1/06	Composite	810	
S7/07-50	Gary Sewell	10/1/06	Composite	830	
S7/07-51	Carm Lilley	10/1/06	Composite	450	
S10/06-18	Dawn Merritt	10/10/06	Grab	1100	
S7/07-01	Kauffman Paul McGary	7/9/07	Grab	690	
S7/07-02	Bartlett Brown Farm	7/10/07	Grab	920	
S7/07-03	Bartlett Knox Farm	7/10/07	Grab	860	
S7/07-52	Sawyer York	8/1/07	Composite	1600	
S7/07-53	R Cameron	8/1/07	Composite	640	
S7/07-54	M Howard	8/1/07	Composite	350	
S8/07-01	Buchalla 78	8/8/07	Composite	730	
S8/07-02	Buchalla 75	8/8/07	Composite	780	
S8/07-03	W. Sanders	8/8/07	Composite	1600	
S8/07-04	L. Nason	8/8/07	Composite	820	
S8/07-05	T. Robertson	8/8/07	Composite	520	
S8/07-06	Virginia Ford	8/8/07	Composite	780	
S8/07-07	Justin Lovely-10	8/8/07	Composite	800	
S8/07-08	Robert Watson-50	8/8/07	Composite	240	
S8/07-09	Robert Watson-25	8/8/07	Composite	640	
S8/07-10	J. Hogan-Callnan	8/15/07	Composite	680	
S8/07-11	J. Hogan-T 2375	8/15/07	Composite	850	
S8/07-12	J. Hogan-T 2374	8/15/07	Composite	630	

LP Corp.	Wood Ash Utilization Site Soil Background/Baseline Mn Concentrations				
Site ID	Site Name	Sample Date	Sample Type	Mn conc. (mg/kg)	Comments
S8/07-13	J. Hogan-T 6361	8/15/07	Composite	660	
S8/07-14	Candace Campbell	8/22/07	Composite	1600	
S8/07-15	Gerry Callnan	8/24/07	Composite	600	
S8/07-16	Andy Mooers	8/24/07	Composite	800	
S8/07-17	Rog. Smith	8/24/07	Composite	540	
S8/07-18	G. Smith Home	8/24/07	Composite	680	
S8/07-19	G. Smith Burton	8/24/07	Composite	1200	
S8/07-20	Perry Mooers	8/24/07	Composite	630	
S9/07-01	Mark Jago	9/3/07	Composite	16	
S9/07-02	Tim Sheldon	9/3/07	Composite	75	
S9/07-03	Tom Zimmerman	9/3/07	Composite	610	
S6/08-02	Clavet T 5117	6/12/08	Grab	720	
S6/08-03	Clavet T 5247	6/12/08	Grab	380	
S6/08-04	Mitchell T 6371	6/12/08	Grab	540	
S6/08-05	Lawler T 2955	6/12/08	Grab	410	
S6/08-06	Willis Green	6/12/08	Grab	950	
S7/08-05	Sherman Catalina Rd	7/20/08	Grab	780	
S5/09-01	Moulton	9/7/08	Grab	360	
S5/09-02	Karen Hopkins	9/7/08	Grab	540	
S5/09-03	Al Moody	9/7/08	Grab	760	
S5/09-04	Sue Pierce	9/7/08	Grab	590	
S5/09-05	Amy Metherall	9/7/08	Grab	940	
S5/09-06	Eric Lincoln	9/7/08	Grab	2700	
S5/09-07	Marc Anderson	9/7/08	Grab	1700	
Statistics:					
Minimum:				16	Lower conc. of <0.76 questionable
Average:				899	
Maximum:				2700	

Excerpt from David Wright's *Technical Support Document*, preliminary draft, dated December 3, 1998

Technical Basis for Screening Standards - Heavy metals in Sewage Sludge. The screening standards for heavy metals in sewage sludge were based on the Technical Support Document For Land Application of Sewage Sludge (ERG, 1992). This document was a 14 pathway risk assessment which formed the basis for the standards in 40 CFR Part 503, Standards for the Use or Disposal of Sewage Sludge. This risk assessment is generally consistent with the protocols used in Maine to conduct similar risk assessments (MEDEP, 1994), although many more pathways of exposure were assessed in ERG 1992, the risk assessment was much more detailed, and the risk assessment was peer reviewed during the promulgation process for the federal standards. A summary of exposure pathways evaluated and a summary table of acceptable residual concentrations based on these pathways is included in appendix I of this Response to Comments.

Technical Basis for Screening Standards - Other Pollutants in Sewage Sludge. The Department's experience through administration of Chapter 567 since 1985 is that other pollutants may be found in sewage sludge, the Department has an obligation under 38 MRSA 1301 et. seq. to evaluate these risks, and that a system is needed to efficiently evaluate the potential risks posed by these contaminates. Additionally, the Department believes that the Federal Government's approach to these other pollutants is inadequate to protect public welfare, in that there is legitimate general public concern about the impact of these contaminants on public health and the environment. This concern, if not addressed through these rules and the licensing process, will result in increased cost to utilization programs and less recycling of residuals. The rule provides an effective, cost efficient system to meet this need. This same system, used by policy for the past 4 years, has proven this.

Technical Basis for Screening Standards - Other Residuals. Hazardous substances have been detected from time to time in residuals generated in Maine. These hazardous substances are often divided into general categories based on the methods used to analyze for them, such as volatile compounds and acid/base-neutral compounds, or by specific chemical classes such as poly-chlorinated biphenyls (PCBs) or dioxins. Sludge or residuals generated in industrial settings have the potential to contain these hazardous substances and therefore Chapter 405 of these rules requires that generators test for these compounds before utilization. Examples of residuals historically found to contain these substances are sewage sludge with industrial inputs, paper mill sludge, and textile sludge.

The rule uses a conservative risk based approach to establish a screening standard below which the Department is confident that the residual can be utilized without impacting a highly exposed individual. If contaminants exceed the screening standard in the residual, the rule provides that the actual risk is evaluated and, if necessary, appropriate risk management steps are taken to prevent impacts to public health or the environment.

The Technical Support Document For Land Application of Sewage Sludge (ERG, 1992) clearly states that the heavy metal risk assessment for sewage sludge was specific to the sewage sludge matrix, and was not applicable to other residuals. That risk assessment also noted that the transport and bioavailablity of heavy metals was very dependent upon the form of the heavy metal, which could be very different in other residuals. Therefore, this risk assessment is inappropriate for use in establishing standards for other residuals.

The screening standards for residuals were derived from several sources. The primary source was the risk based soil guidelines for residential exposure published by EPA Region III's Superfund Technical Support Section (EPA III, 1997), commonly known as the "RBCs". The RBCs are designed to protect a highly exposed individual (generally a playing child) in a residential setting

that ingests soil particles as part of normal activities. The derivation of the RBCs is included in Appendix II. The exposure values used to derive the RBCs are generally consistent with the default exposure values used for risk assessments in Maine (MEDEP, 1994), with the exception of exposure frequency. The RBCs were therefore adjusted from an exposure frequency of 350 days per year to the 143 days per year used in Maine.

The RBCs, however, do not take into account the transfer of pollutants from soil into groundwater. The Department used the Soil Screening Levels for Migration to Groundwater (SSL's), published by USEPA for this pathway of concern. The Department choose the Dilution/Attenuation Factor (DAF) of 20 since this is consistent with the Synthetic Leaching Potential Test (SLPT) and is generally protective of health. Generators could use the SLPT to determine if a residual that exceeded the screening standard based on a SSL did in fact leach out that contaminant.

The lower of the adjusted RBC or the SSL was selected as the preliminary sceening standard for a contaminant, and was then further adjusted for the endpoint in Chapter 419, Section 2.B(3)(a)(i) of an Incremental Lifetime Cancer Risk of 5×10^{-6} and a Health Index of 1/2. This endpoint is established at 1/2 a clean-up level that would be established for an Uncontrolled Hazardous Substance Site under 38 MRSA 1361 et. seq. Uncontrolled sites are the state equivalent of federal superfund sites.

The screening standard for lead was further reduced to be consistent with the DEP and Department of Human Services risk assessment policy for residential exposure to lead contaminated soil (MEDHS, 1994). The screening standard for mercury was further reduced based on potential ecological impacts as identified in the Holtrachem risk assessment done for the Department's hazardous waste facility licensing program (CDM, 1995). The screening standards for copper and zinc were further reduced based on potential phytotoxic impacts as identified in ERG, 1992.

Technical Basis for Screening Standards - Ash and other liming agents. To establish the screening standards for liming agents, the residual concentration screening standards for other residuals, above, was used as the acceptable cumulative pollutant loading to the soil. Acceptable liming agent concentration was derived using the following formula (ERG, 1992):

$$PC=(RPc*CE)/(SL*LR*0.001)$$

where: PC - Concentration of Pollutant in the Residual (mg-pollutant/kg-residual (dry weight))= liming agent standard
CE - Calcium carbonate equivalents of the agent = 15%, 25%, 50% 75% and 85%.
SL - number of times residual is applied over the life of a site (100 years) = 20
LR - Residual loading rate in mt-residual/ha (amount of residual applied in a year) = 3 tons/yr = 7mt/ha
RP_c - Acceptable Cumulative Pollutant loading kg-pollutant/ha
.001 - Conversion factor = 1,000 kg/mt * 0.000001 kg/mg

The rule allows the acceptable metal concentration in ash to increase with increased calcium carbonate equivalents of the ash. This is allowed since the higher the calcium carbonate equivalents, the less ash is needed to achieve the soil pH adjustment, and the lower the loading rate will be.

Technical Basis for Screening Standards - Soil. Once residual concentration standards were established, the Department established screening standards for soil at utilization sites. For sewage sludge, the Department used the risk assessment for heavy metals done for the federal regulation (ERG, 1992) when possible. For other parameters in sewage sludge, the Department was able to conservatively estimate how much sludge would be utilized at a site, based on the nitrogen content of sludge and conservative utilization practices. The Department used the approach in ERG, 1992 to back calculate acceptable soil concentrations based on acceptable sludge concentrations, as follows. The acceptable cumulative pollutant loading rate was set to the residual screening level, as derived above. Conservative assumptions include a loading rate of 10 metric tons/acre for 100 years in a row.

$RPc = (MS * 10^{-9}) / (PC * LR * SL)$

Where: RP_c - Acceptable Cumulative Pollutant loading kg-pollutant/ha

MS - Dry Mass of soil in a hectare is approximately $2.0 * 10^9$ g-soil/ha, based on a bulk density of 1.33 g/cm^3 and a plow layer of 15 cm.

PC - Concentration of Pollutant in the Residual (mg-pollutant/kg-residual (dry weight))= Residual standard

LR - Residual loading rate in mt-residual/ha/yr (amount of residual applied in a year) = 10

SL - Site Life, or the number of times the residual will be applied at the site in 100 years, in years = 100.

10^{-9} - conversion factor = 1000 kg/mt * 1,000,000 g/mt

However, for other residuals, it is not possible to *a priori* determine what the loading rate will be because the nitrogen content of the residual cannot be determined for all residuals, and the agronomic benefic may in fact not be nitrogen loading. The formulas used to establish appropriate residual concentrations based on actual loading rates are included in appendix 419.B of the rule, and will be established during the licensing process.

The soil screening standards were then adjusted upwards (less conservative) in cases where typical background concentrations would exceed the calculated soil concentration. In these cases, the soil standard was established as the upper background range for soil (ASTDR, 1994; Pollock, 1995; and Shacklette and Boerngen, 1984).

Conclusion: These guidelines are designed to protect a highly exposed individual ingesting either soil or groundwater contaminated by soil. The approach of screening residual concentrations against guidelines developed for soil errs on the side of protecting human health since the approach does not take into account the dilution, volatilization and degradation that may reduce contaminant concentrations at the utilization site (Overcash, 1981, Howard, 1991). However, in the majority of instances, the contaminant concentrations found in residuals are less than these conservative screening guidelines. In situations where residuals exceed these screening guidelines, residual specific research into degradation processes or more sophisticated risk assessments will be conducted to determine if the residual can be safely utilized, and what management practices are needed.

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END

DEP-estimated wood ash disposal cost (landfill)

Duncan, Jay B

From: Darling, Cyndi W
Sent: Thursday, November 05, 2009 10:20 AM
To: Duncan, Jay B
Subject: FW: Wood Ash Disposal Pricing into JRL

Jay,

The below figure is the current cost for disposal at the Juniper Ridge Landfill of wood ash.

Please contact me if you need additional information.

Cyndi Darling
Maine Dept. of Environmental Protection
Bureau of Remediation & Waste Management
Division of Solid Waste Management
Eastern Maine Regional Office
207-941-4580
cyndi.w.darling@maine.gov

From: Tom Gilbert [mailto:Tom.Gilbert@CASELLA.COM]
Sent: Thursday, November 05, 2009 10:16 AM
To: Darling, Cyndi W
Subject: Wood Ash Disposal Pricing into JRL

Cyndi:

As discussed, the standard disposal fee for wood ash into Juniper Ridge Landfill is currently $54.65 per ton. This price includes the $5.00 per ton "Special Waste Fee" that goes to the MDEP.

Tom Gilbert
Environmental Compliance Manager
Pine Tree & Juniper Ridge Landfills
Casella Waste Systems
358 Emerson Mill Road
Hampden, Maine 04444
Office Tel: (207) 862-4200 ext.245
Office Fax: (207) 862-2839
Cell: (207) 852-4134

Duncan, Jay B

From: Mark Draper [tcl@ainop.com]
Sent: Thursday, November 05, 2009 9:54 AM
To: Duncan, Jay B
Subject: RE: disposal costs for wood ash

Hi Jay,

Well, as with most things, it is not a simple answer. We do have tipping fees established for ash disposal at the landfill. However, they are variable depending on the municipality in which the waste is generated. For example, if the waste is generated from within one of the three owner towns, the rate is much lower. Also, the rates are set primarily to address ash received in relatively small quantities - from a burned building for example.

The scenario for which you are seeking information (large volumes of ash received on a regular basis) would be handled differently - with tipping fees established by the Board of Directors on a case-by-case basis. Because we don't really care how much the waste weighs, but rather how much space it occupies, the fee would be based more-or-less on the bulk density of the material; relative to the bulk density and tipping fees for municipal solid waste. Here's an example:

The tipping fee for MSW from a contracted town (not an owner town) is currently $75/ton. The bulk density of MSW compacted in the landfill is 1,250 lbs./c.y. If we were going to determine a tipping fee for a material with a bulk density 2X that of MSW (2,500 lbs./c.y.), we would start with a tipping fee of $37.50/ton (half of $75). There would be other considerations of course, but that would be the starting point. Unfortunately, fly ash tends to be light, so the tipping fee would tend to be high. If you had an estimate of the bulk density of this particular ash, we could calculate an estimate from that.

I don't know if I've helped much, so please feel free to give me a call to discuss further if necessary.

Mark C. Draper
Solid Waste Director
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Fax. (207) 472-1619
e-mail: TCL@ainop.com

From: Duncan, Jay B [mailto:Jay.B.Duncan@maine.gov]
Sent: Thursday, November 05, 2009 8:37 AM
To: Draper, Mark
Subject: disposal costs for wood ash

Good morning Mark.

I am working on a project that involves the disposal cost for wood (fly) ash from a facility such as Boralex Fort Fairfield and that is approved for and routinely used for agronomic utilization. I need to determine what the disposal cost would typically be, per ton, at a licensed solid waste facility (e.g., landfill). Can you provide me with what that cost would be at Tri-Community?

Thank you.

Jay